International Symposium on management of *Tuta absoluta*
Agadir, Morocco, November 16-18, 2011

Necremnus artynes (Walker, 1839) (Eulophidae), a potential beneficial for the biological control of *Tuta absoluta* (Meyrick, 1917)

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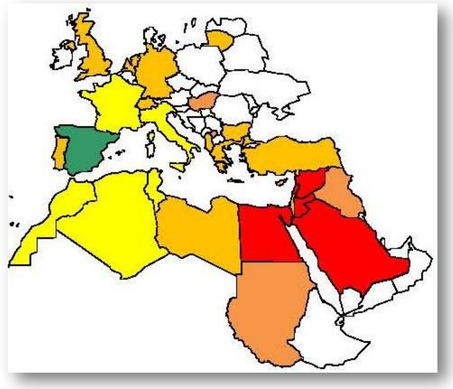
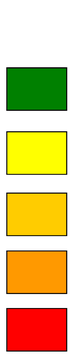
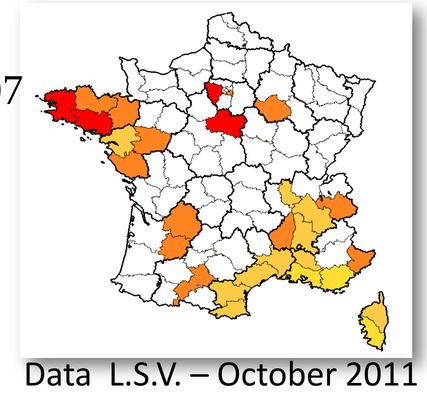
Since its initial detection in Spain in 2006, the gelechiid *Tuta absoluta* spread rapidly in the Mediterranean Basin and even elsewhere in Europe. It is now a major constraint for all tomato growers (Deneux *et al*., 2010). At this moment, the best strategy to manage the pest is based on the IPM system which includes : pheromone mimic, natural enemies, mass trapping and chemicals. Nevertheless, this strategy is sometimes unsuccessful depending on farming system, climatic conditions, countries etc... During the spring 2011 a serie of parasitoids reared from young larval stages of *Tuta* in Southern France (near Marseille) were identified by Andrew Polaszek as belonging to *Necremnus artynes.* Nevertheless, the individuals reared from *Tuta* show a high morphological variability and are somewhat different from the usual form.

Tuta absoluta' distribution





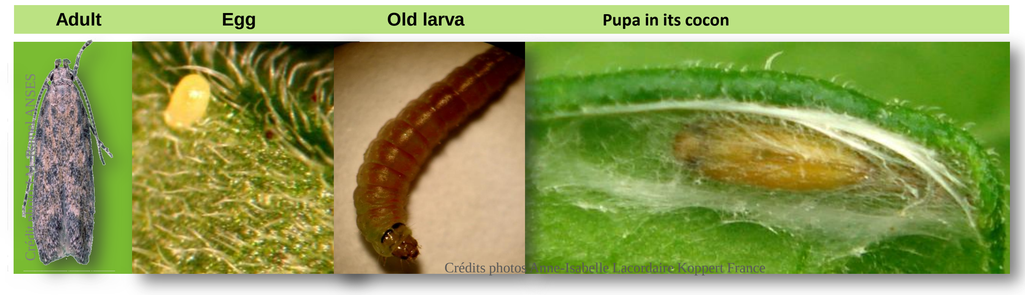
In France



Data L.S.V. – October 2011

Diagnosis

genitalia



Differential characters within populations of *Necremnus artynes*

Features	*Necremnus artynes* Tuta	*Necremnus artynes* wild populations
Morphological characters	quite variable (wing infumation, gaster length, etc)	relatively constant
Hosts	*Tuta absoluta*	host(s) not known
Distribution	Mediterranean Basin: Italy, Southern France, Spain, Morocco, Algeria	widely distributed: Eurasia and Mediterranean Basin from Canary Islands to Mongolia including UK
Bioclimatic conditions	mediterranean	oceanic, continental, mediterranean, arid
Elevation	lowlands	lowlands and highlands: 0-2000 m

Main beneficials for the control of *Tuta absoluta*

Developmental instars / Beneficials	Eggs and young larvae	Mature larvae
***Trichogramma* spp. (Trichogrammatidae)**	Cabello *et al*., 2009 Spain	
***Macrolophus pygmaeus* (Rambur) (Miridae)**	Mollà et al. (2009) Urbaneja et al. (2009) Spain	Mollà et al. (2009) Urbaneja et al. (2009) Spain
***Nesidiocoris tenuis* Reuter (Miridae)**	Mollà et al. (2009) Gabarra & Arnó (2010) Spain	Mollà et al. (2009) Gabarra & Arnó (2010) Spain
***Necremnus artynes* (Walker) (Eulophidae)**	Mollà et al. (2008) Gabarra & Arnó (2010) Spain	
***Agathis fuscipennis* (Zetterstedt) (Braconidae)**		Loni *et al*. (2011) Italy

Are populations of *Necremnus artynes* of the morphotype *Tuta* indigenous?

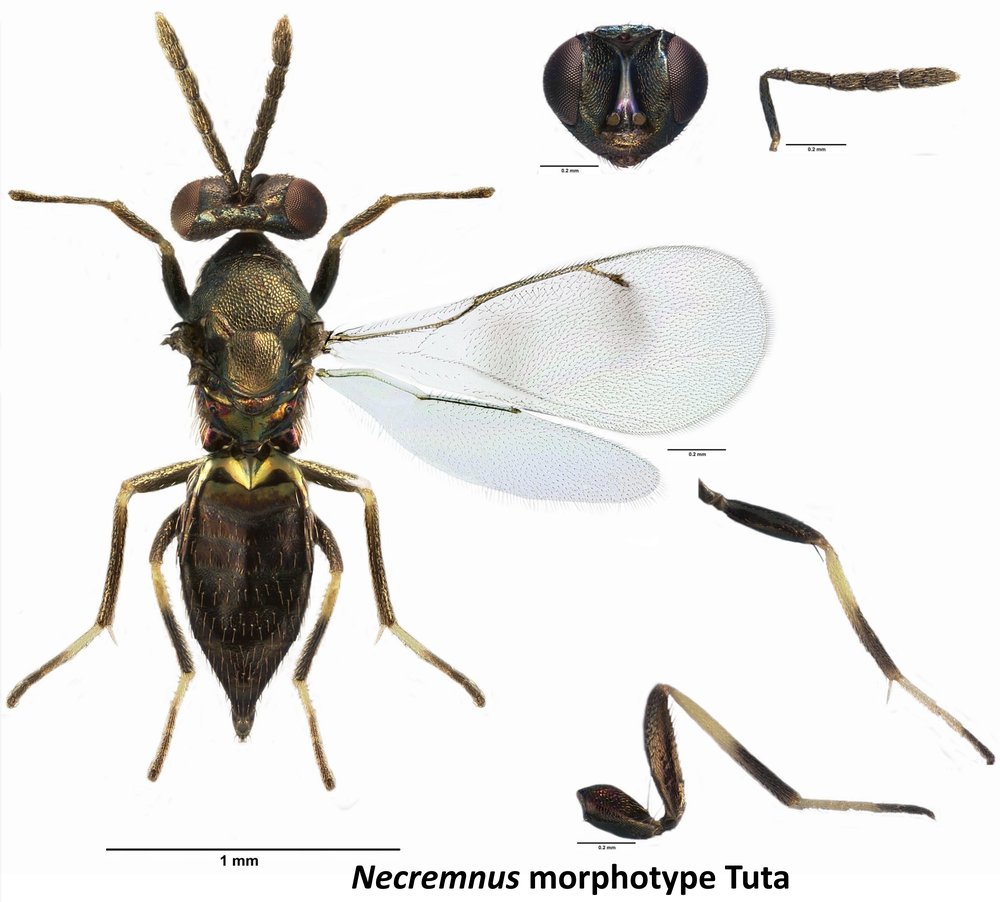
- *Necremnus* is mainly present in northern temperate zone
- No *Necremnus* found in samples examined (over 100 000 specimens) from tropical regions
- The only neotropical *Necremnus* sp. – described from Bahamas – does not fit with the species reared in Europe and Northern Africa from *Tuta*
- Nevertheless new regulations being set up often require proof of the indigenous status of the beneficial used in biological control projects

Evaluating the genetic diversity on a large sampling from various countries will:

- Definitively solve the question of a possible introduction of the *Necremnus Tuta* morphotype
- Precise its taxonomist status

Perspectives

- International network needed for large sampling in a similar way as to differentiate *Pnigalio* populations (Bernardo et al., 2008)
- Sequencing and molecular analysis using a mitochondrial and nuclear genes coding for proteins
- Extracting DNA now preserves specimens: possible feed back to morphology and voucher specimens
- Already available for study: *Necremnus* specimens of the *Tuta* morphotype collected in a non cultivated environment; several specimens of the *N. artynes* usual morphotype



***Necremnus* morphotype Tuta**

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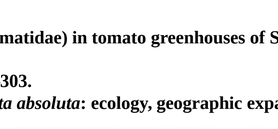

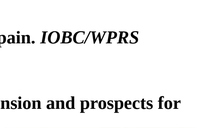

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